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BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Application Number: 10/696,048
Filing Date: October 29, 2003
Appellant(s): GRUSHIN ET AL.

John H. Lamming
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed on 22 January 2007 appealing from the Office action mailed on 03 July 2006.

(1) Real Party in Interest

A statement identifying by name the real party in interest is contained in the brief.

(2) Related Appeals and Interferences

The following are the related appeals, interferences, and judicial proceedings known to the examiner, which may be related to, directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal:

An appeal brief has been filed for application serial number 10/983,119, which is related to the instant application because they both claim priority to the same provisional applications (60/215,362 and 60/224,273) and descend from the same non-provisional application (09/879,014).

(3) Status of Claims

The statement of the status of claims contained in the brief is incorrect. A correct statement of the status of the claims is as follows:

This appeal involves claims 12-18.

Claims 1-11 have been canceled.

Claims 19-22 are not entered.

(4) Status of Amendments After Final

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

(5) Summary of Claimed Subject Matter

The summary of claimed subject matter contained in the brief is correct.

(6) Grounds of Rejection to be Reviewed on Appeal

The appellant's statement of the grounds of rejection to be reviewed on appeal is correct.

(7) Claims Appendix

The copy of the appealed claims contained in the Appendix to the brief is correct.

(8) Evidence Relied Upon

US 6,169,184 B1	Hamprecht et al.	1-2001
US 6,894,307 B2	Forrest et al.	5-2005

P. I. Djurovich et al., "Ir(III) Cyclometalated Complexes as Efficient Phosphorescent Emitters in Polymer Blend and Organic LEDs," Polmer Preprints vol. 41, no. 1, pp. 770-771 (2000).

K. Dedeian et al., "A New Synthetic Route to the Preparation of a Series of Strong Photoreducing Agents: fac Tris-Ortho-Metalated Complexes of Iridium (III) with Substituted 2-Phenylpyridines," Inorg. Chem. vol. 30, pp.1685-1687 (1991).

(9) Grounds of Rejection

The following grounds of rejection are applicable to the appealed claims:

Claims 16-18 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Hamprecht et al. (US 6,169,184 B1) in view of Forrest et al. (US 6,894,307 B2) and the article by Djurovich et al. in Polymer Preprints (vol. 41, 2000, pp. 770-771 – from appellant's IDS).

Hamprecht et al. disclose the compound as claimed in claim 16, namely, 5-methyl-2-(2,4-difluorophenyl)pyridine (See col. 1, lines 5-27). In formula I of Hamprecht et al., R4 can be an alkyl (e.g. methyl), R3 and R5 can be hydrogen, and R1 and R2 can be fluorine.

However, Hamprecht et al. do not teach or suggest that this compound can be used as a precursor for an iridium compound used as an organic layer in an electronic device, which is a limitation of claim 16. More specifically, Hamprecht et al. do not teach or suggest that the organic layer can be a light emitting layer (the limitation of claim 17), nor do they teach or suggest that the organic layer can be a charge transport layer (the limitation of claim 18).

Djurovich et al. teach an organic LED (see Introduction, first paragraph) with iridium complexes that include difluorophenylpyridine ligands. However, regarding claim 16, Djurovich et al. lack the as-claimed methyl group and, further, do not expressly teach or suggest that the fluorine substituents be located in the R1 and R2 positions, as taught by Hamprecht et al. Forrest et al., like Djurovich et al., disclose substituted phenylpyridine ligands for iridium complexes, and further teach that the substituents can include alkyls (e.g. methyl) and, further, that the substituents can be located in any position on either ring of the phenylpyridine ligand (see column 17, line 44 to column 18, line 27). Also, regarding claim 18, Forrest et al. teach that the emissive layer can include a hole transporting matrix (see column 10, line 64 to column 11, line 17).

Therefore it would have been obvious to a person of ordinary skill in the art at the time the invention was made to combine the teachings of Hamprecht et al., Forrest et al., and Djurovich et al. in order to use formula I of Hamprecht et al. as a precursor for iridium complexes used in organic light emitting layers as taught by Forrest et al. and Djurovich et al. Forrest et al. recognize that the inclusion of an alkyl substituent (e.g. methyl) is within the skill level of the art to obtain desired emissive properties (see column 17, line 44 to column 18, line 27) and Djurovich et al. recognize that solubility in organic solvents is improved with the addition of the fluorine substituents (see paragraph bridging pp. 770-771).

Claims 12-15 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Hamprecht et al. (US 6,169,184 B1), Forrest et al. (US 6,894,307 B2), and the article by Djurovich et al. in Polymer Preprints (vol. 41, 2000, pp. 770-771 – from appellant's IDS) as applied to claims 16-18 above, and further in view of the communication by Dedeian et al. in Inorganic Chemistry (vol. 30, 1991, pp. 1685-1687 – from appellant's IDS).

As shown above, the combination of Hamprecht et al., Forrest et al., and Djurovich et al. have all of the limitations set forth in claims 16-18 of the appellant's invention. Also, this combination covers the further limitations to claim 12 as set forth in claims 13-15. However, this combination lacks the compound with the structures as set forth in claim 12. Referring to Table I, Dedeian et al. disclose fluoro- and trifluoromethyl-substituted 2-phenylpyridines as light-emitting materials, as shown in the upper, right-hand corner of p. 1686.

Regarding any of the as-claimed structures in claim 12 with two fluorines, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to locate the alkyl (e.g. methyl) and fluorine substituents of Hamprecht et al. in any position on either ring of the phenylpyridine ligand, as suggested by Forrest et al., to thereby obtain desired emissive properties. Forrest et al. recognize that such a modification is within the skill level of the art (see column 17, line 44 to column 18, line 27).

Regarding any of the as-claimed structures in claim 12 with either one fluorine or one trifluoromethyl, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to modify the structure of Hamprecht et al. to include just one fluorine or just one trifluoromethyl, as taught by Dedeian et al., in any position on either ring of the phenylpyridine ligand, as suggested by Forrest et al., to thereby obtain desired emissive properties. Dedeian et al. recognize that facial iridium phenylpyridine complexes that are substituted with either one fluorine or one trifluoromethyl can be successfully prepared (see page 1686, paragraph bridging the first and second columns). Forrest et al. recognize that such modifications are within the skill level of the art (see column 17, line 44 to column 18, line 27).

(10) Response to Argument

The appellant argues that a *prima facie* case of obvious has not been established (see page 4, lines 8-12 and page 6, lines 9-10). This argument is not found to be persuasive because the combination of Hamprecht et al., Forrest et al., and Djurovich et

al. have all of the claim limitations of claims 16-18 and the combination of Hamprecht et al., Forrest et al., Djurovich et al., and Dedeian et al. have all of the limitations of claims 12-15, the applied references provide motivation for these combinations, and Djurovich et al. indicate a reasonable expectation for success when using iridium complexes that feature fluorine-substituted phenylpyridine ligands in organic light emitting diodes while Forrest et al. indicate a reasonable expectation for success when modifying iridium complexes that feature substituted phenylpyridine ligands by changing the location of substituents.

Further regarding motivation for the above combinations, motivation for combining the references is found within the references themselves. Namely, Forrest et al. recognize that the inclusion of an alkyl substituent (e.g. methyl) to obtain desirable emission properties is within the skill level of the art (see column 17, line 47 to column 18, line 27), Forrest et al. also recognize that substituents (R) can be located in any position on either ring of a phenylpyridine ligand (as shown in the structure on the left side of column 18, lines 1-12), Djurovich et al. recognize that solubility in organic solvents is improved with the addition of fluorine substituents (see paragraph bridging pages 770-771), and Dedeian et al. recognize that facial iridium phenylpyridine complexes that are substituted with either one fluorine or one trifluoromethyl can be successfully prepared (see Table 1 and the paragraph bridging the first and second columns of page 1686).

In response to appellant's argument that Hamprecht et al. is nonanalogous art with regards to claims 13-18 (see page 4, lines 6-7), it has been held that a prior art

reference must either be in the field of appellant's endeavor or, if not, then be reasonably pertinent to the particular problem with which the appellant was concerned, in order to be relied upon as a basis for rejection of the claimed invention. See *In re Oetiker*, 977 F.2d 1443, 24 USPQ2d 1443 (Fed. Cir. 1992). In this case, the appellant's claims 12-18, Hamprecht et al., Forrest et al., Djurovich et al., and Dedeian et al. are all in the same field of endeavor. That is, organic compounds that utilize phenylpyridine ligands.

Regarding claims 16-18, the appellant argues that neither Hamprecht et al., Forrest et al., nor Djurovich et al. disclose a claimed compound (see page 4, second full paragraph). However, the precursor compound as set forth in claim 16 is anticipated by Hamprecht et al., per MPEP section 2131.02, which states that "a reference that clearly names the claimed species anticipates the claim no matter how many other species are named". That is, Hamprecht et al. clearly indicate for their formula I that R4 can be an alkyl, R3 and R5 can be hydrogen, and R1 and R2 can be fluorine (see col. 1, lines 5-27). Further, Hamprecht et al. clearly indicate that the alkyl corresponding to their formula I can be methyl as indicated in column 7, lines 32-33, 36-38. So, Hamprecht et al. do disclose a specific teaching of the precursor compound as set forth in the appellant's claim 16.

Further regarding claims 16-18, the appellant argues that the combination of Hamprecht et al., Forrest et al., and Djurovich et al. lack motivation (see page 5, lines 3-9). However, as indicated above, the applied references demonstrate that fluorine and methyl (as well as trifluoromethyl) would have been known substituents, to a person of

ordinary skill the art at the time the invention was made, for a phenylpyridine ligand, as would the location of these substituents in any position on either ring of the ligand.

Still further regarding claims 16-18, the appellant argues that the obviousness determination has been made through impermissible hindsight (see page 5, lines 10-15). However, it is noted that the appellant's arguments do not include an argument that knowledge used in the rejection of claims 16-18 was gleaned only from the appellant's disclosure. Instead, the arguments that are presented attack either Hamprecht et al., Forrest et al., and Djurovich et al. when taken alone and, accordingly, do not address what the combination of Hamprecht et al., Forrest et al., and Djurovich et al. when taken as a whole would suggest to one of ordinary skill in the art.

Regarding claims 12-18, in response to appellant's arguments against the Hamprecht et al., Forrest et al., Djurovich et al., and Dedeian et al. references individually (see pages 3-6), one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

The appellant argues that Djurovich et al. lack the claim features of alternative placement of fluorine atoms on the phenyl ring, any substituent located on the pyridine ring, and alkyl substituents (see page 3, third full paragraph). However, Hamprecht et al. teach fluorine atoms on the phenyl ring at the same locations as claimed by the appellant, Hamprecht et al. and Forrest et al. teach alkyl substituents on the pyridine ring, and Dedeian et al. teach a trifluoromethyl substituent on the phenyl ring, and three

of the appellant's as claimed compounds in claim 12 use only one triflouromethyl substituent on the phenyl ring.

The appellant also argues that Hamprecht et al. lack iridium complexes (see page 4, third full paragraph). However, Forrest et al., Djurovich et al., and Dedeian et al. all teach iridium complexes that feature substituted phenylpyridine ligands.

The appellant further argues that neither Forrest et al. nor Djurovich et al. disclose the phenylpyridine structure of claim 16 and that Forrest et al. lack fluorine substituents (see paragraph bridging pages 4-5). However, as indicated above, Hamprecht et al. anticipate the precursor compound of claim 16, and Hamprecht et al., Djurovich et al., and Dedeian et al. all disclose fluorine substituents for the pyridine ring corresponding to phenylpyridine ligands.

The appellant still further argues that the disclosure of Dedeian et al. lack any of the structures as claimed in claim 12 and that Dedeian et al. do not expressly teach or suggest electroluminescent complexes (see pages 5-6). However, the combination of Hamprecht et al., Forrest et al., Djurovich et al., and Dedeian et al. includes the teachings of Forrest et al., who teach that substituents can be located on any position of a phenylpyridine ligand. Accordingly, regarding claim 12, the combination of Hamprecht et al., Forrest et al., Djurovich et al., and Dedeian et al. at least suggest the as-claimed structures that have two fluorine substituents on the phenyl ring and the as-claimed structures that have one trifluoromethyl substituent on the phenyl ring. Also, the disclosure of Forrest et al. and Djurovich et al. both teach that iridium phenylpyridine complexes exhibit light emissive properties.

(11) Related Proceeding(s) Appendix

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

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